# The German Aerospace Industry Maintains its Ascent

*Juergen Mueller*
*U.S. Commercial Service Germany*
*September 1, 2005*

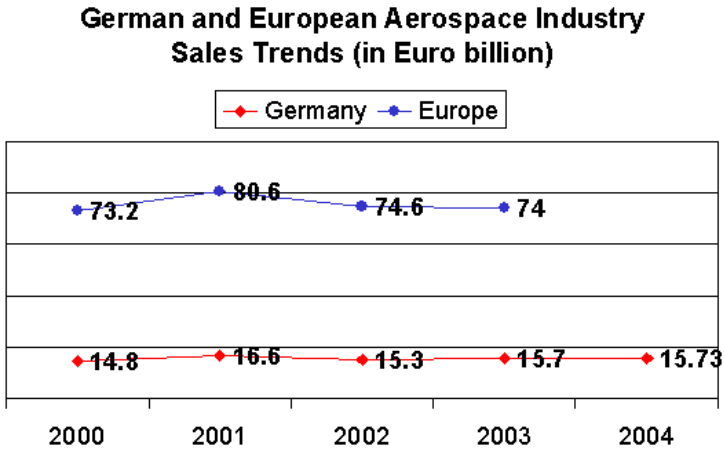


## Summary

The German aerospace industry remains in an upswing and is expected to reach record sales revenue this year. The industry has recovered significantly from its downturn in 2001-2002, with total sales of €15.7 billion in 2004. This positive development is being sustained by large increases in expenditure on research and development. The civil aviation sector, which accounted for 63% of total sales last year, is set to retain its position as the industry leader. Although development among the individual aerospace sectors varied, prospects for the industry as a whole remain positive.

## Market Overview

The European aerospace industry grosses an average €70 billion in annual revenue, roughly one-fifth of which is generated in Germany. The aerospace industry is also of enormous strategic importance to the German economy. With an unparalleled level of investment in research and development, the sector is a driving force for technological advance in Germany and in Europe. The amount Germany's aerospace industry spends on research and development in proportion to sales is considerably higher than any of its other industries, ranging from 15 to 20% of total sales annually (BDLI). The German aviation sector, in particular, has become a highly productive partner in the European network, establishing an international reputation for expert know-how in systems and structures. Last year, the aerospace industry's sales grew by 1.9% – a rise of €300 million over 2003 – with the level of expenditure and investment on research and development at a record high of over €3 billion (BDLI - German Aerospace Industries Association). There are many indicators that suggest further growth for the German aerospace industry and the BDLI expects total revenue for 2005 to well exceed the €16 billion mark.

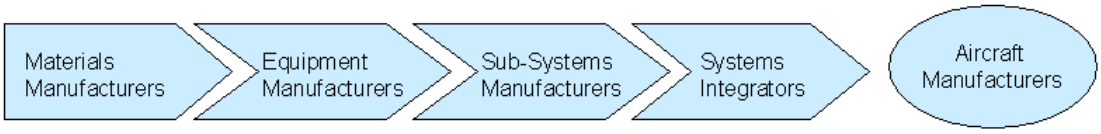



Source: BDLI (German Aerospace Industries Association). *Aerospace Statistics 2003/2004.* www.bdli.de

The proportion of small and medium-sized enterprises in Germany at the supplier level is bigger than in other countries. This results in a competition with well established corporations operating globally; large firms and global players generate the lion's share

of total industry revenue. Only a small fraction of companies in the German aerospace market are involved in "front-end" supply chain activities. In contrast, most German suppliers are positioned "left" along the supply chain in the materials and equipment industry. EADS and Airbus are the supporting pillars of the aerospace industry. Through direct and indirect sales, German materials and equipment suppliers generate nearly 40% of their revenue from the EADS group (BIC - Business + Innovation Center).

**Aerospace Supply Chain Structure**




Source: BIC (Business + Innovation Center). *Deutsche Luft- und Raumfahrtindustrie Marktanalyse*, 2004. www.bic-kl.de

Germany's aerospace commerce is concentrated in Bavaria, Brandenburg, Hamburg, and Bremen, where EADS and Airbus operations are located. The industry drivers in Bavaria are military and space. Structures and engines represent the key market segments for Brandenburg. In Hamburg and Bremen, the focus is on civil aviation, in particular cabin interiors, maintenance, and wings for Airbus aircraft. Hamburg and Bremen are the largest Airbus sites in Germany. Production activities in Hamburg include fuselage structural assembly and systems installation. In Bremen the entire process chain for the wing high lift is established.

## Civil Aviation

Civil aviation passenger and freight volumes have recovered significantly from the previous downward trend. Civil aviation constitutes the largest sector of the German aerospace industry, accounting for 63% of revenue in 2004 (BDLI). The sector's 4.7% growth in sales last year was largely driven by the success of Airbus, which became the world's largest manufacturer of commercial aircraft in terms of numbers of aircraft delivered (BDLI). Airbus has particularly profited from the rapid growth of the low-cost carrier segment throughout Europe. Airbus' increase in output has also prompted gains for German equipment manufactures.

## Military and Defense

In 2004, the military aviation and defense sector accounted for 29% of aerospace sales revenue, with the equipment sub sector accounting for 45% of the €3 billion in defense-based sales (BDLI). The importance of military aviation is also expected to increase in response to the prospering civil aviation industry. Further supporting the sector is the stabilizing effect that military programs are having on sales. Increased volume production for the Eurofighter combat aircraft as well as the Tiger and NH-90 military helicopter programs are expected to significantly increase the share of military aviation and technology in the total sales of the German aerospace industry. The start of production for the Airbus A400M military transport aircraft early this year will have an additionally important impact on the sector's overall performance.

## Space

The European space market is primarily made up of satellites and rocket manufacturing and launch services. Germany is an important partner in the current European space projects and is particularly active in the Galileo satellite navigation system and the Ariane launcher program. However, in contrast to the civil and military aviation sectors, sales revenue in the German space industry continues to dwindle. The downturn in the

telecommunications sector has had a major impact on the commercial markets for satellites and launchers. Moreover, Germany has considerably reduced funding for its national space program. The repercussions of both situations can be seen in job losses and a further drop in the market share of space commerce, which comprised just 8% of total industry sales last year (BDLI).

**Market Trends**

The formation of the European Aeronautic Defense and Space Company (EADS) in 2000 was a milestone in the consolidation of the European aerospace industry at the prime manufacturer level. Today, the industry has further combined to one or two dominant contractors in each major product sector. This consolidation has led to more equal partners as well as stronger competitors for U.S. companies. At the supplier level, however, the aerospace industry remains relatively fragmented. This is especially true in Germany, where consolidation of the aerospace market has been limited to the segments of defense technology, control systems, and civil avionics.
At the same time, intensified competition has increased the need for cooperation at all points along the supply chain. As a result, the relationship between primes and suppliers is transforming into a "partnership supply chain" in which business risk is shared. Thus, a company can only become a "preferred supplier" if it is capable of shouldering some of the financial burden. For Germany's materials and equipment manufacturers, most of which are small and medium-sized companies with limited financial resources, this situation is proving problematic. To survive global competition, Germany's aerospace suppliers have had to build stronger networks through increased collaboration; otherwise, the industry runs the risk of slipping to lower levels of the supply chain and foregoing participation in international programs.

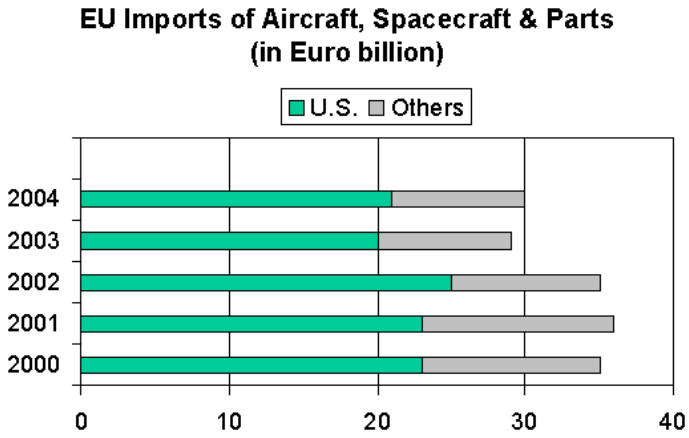
The European aerospace industry has also undergone a radical transformation over the past years in terms of market structure, with civil aviation overtaking military and defense business as the industry leader. The same is true for Germany, where civil aviation is set to retain the largest share of the market in the coming years. As air traffic volumes steadily increase, so too will the demand for new aircraft as well as for equipment and services in the civil aviation sector.

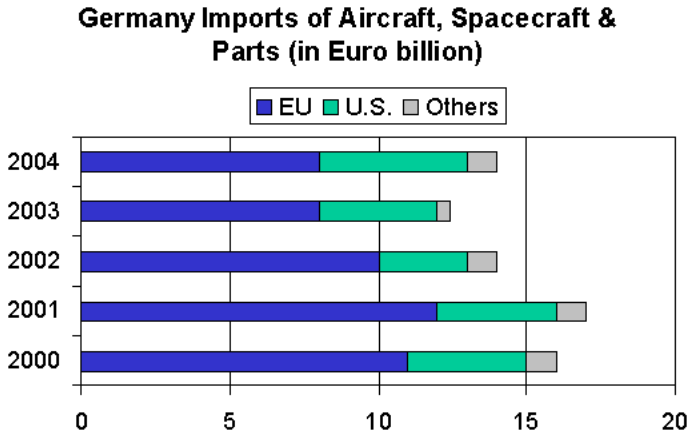
Growth in air transport volumes throughout the world is also driving demand for improvements in fuel consumption – as an economic isse - and aircraft's environmental performance like air pollution and noise reduction – as requirements by local authorities. In this regard, research & development activities in the German civil aviation sector are focusing on engine technology, aerodynamics, and structural weight to maximize aircraft energy efficiency.

**Import Market**

American companies generate 44% of worldwide aerospace sales with European companies following closely behind at 39% (BDLI). U.S. companies have also captured around 70% of the European market for aerospace products (Eurostat). The intra-aerospace business continues to underline the strong interdependence between EU and U.S. industries. In 2004, the EU member states imported aerospace products worth some €30 billion, more than €20 billion of which originated from the United States. (Eurostat). The EADS group incorporates a high percentage of U.S. content in their commercial and defense aerospace products. In fact, Airbus is the largest export customer of the American aerospace industry worldwide, procuring around €5 billion worth of products from American suppliers annually and supporting around 140,000 U.S. jobs.

Germany is also a main export market for U.S. aerospace products: €4.6 billion in 2004 (Eurostat). U.S. aerospace exports to Germany have more than recovered from their fall in 2002. Last year, American products accounted for 32% of total German aerospace imports, which is around half the share of imports from other EU members. Despite the geographic advantage European manufacturers' hold over U.S. companies, the share of imports from the United States to the German aerospace industry continues to grow.




Source: Eurostat (2005). www.europa.eu.int

**Competition**

The European aerospace industry is characterized by a high degree of consolidation and cooperation. The three leading aerospace and defense companies in Europe – EADS (Netherlands), BAE Systems (UK), Thales (France) – are interlocked with each other and with many other European firms through a complex network of joint ventures, collaborative programs, and cross-ownerships.

EADS (European Aeronautic Defense and Space Company) is the largest aerospace and defense company in Europe and the second largest worldwide. The EADS group is active in the fields of civil and military aircraft, space, defense electronics, and security systems. EADS' largest holding is an 80% share in Airbus (BAE Systems owns the other 20%), which has surpassed Boeing as the world's leading maker of large commercial aircraft. Other EADS operations include the world's largest helicopter supplier, Eurocopter; the space company Astrium; and MBDA, the second largest missile company in the global market. EADS is also a major partner in Ariane Space and in the Eurofighter consortium. In 2004, the company reported revenue of €31.8 billion, of which sales within Europe accounted for 45%.

The principal market segments of the German aerospace industry are engines, components and equipment, and aircraft services. The major players in each of the segments are listed below. However, the companies named represent only a small portion of the total number of firms active in these fields.

Engines

Rolls-Royce Aero Engines is the major engine manufacturer in Germany. The company designs, develops, and manufactures gas turbine engines for military, airline, and corporate aircraft. In 1990 BMW and Rolls-Royce established a joint venture to produce engines for regional and corporate jets. Rolls-Royce then took full control of the joint venture under the name Rolls-Royce Deutschland in 2000.

The second largest engine manufacturer in Germany is MTU Aero Engines. The company produces engine modules, components, and complete aero engines for civil and military aircraft as well as provides service support for aircraft engines. MTU also cooperates closely with other major jet engine makers such as Pratt & Whitney, General Electric, and Rolls-Royce.

Components and Equipment

Diehl Avionik Systeme GmbH is the key player the in German avionics equipment market. The company provides a wide array of equipment, including display systems, flight control systems, processing equipment, and engine and auxiliary power unit control systems. It is the largest avionics supplier in Germany and is involved in all major European aircraft programs, including Airbus and Eurofighter. The company's major strategic partner is Thales Avionics. Diehl Avionik is a division of Diehl VA Systeme. Diehl Luftfahrt Elektronik GmbH, which provides cabin lighting and secondary power systems, is also part of the Diehl group.

Another major company in this field is Liebherr-Aerospace, which supplies aircraft flight control and actuation systems, hydraulic systems, and landing gears. Liebherr is closely involved in the development and manufacturing of flight control and air systems for the Airbus A380. Last year the company joined Diehl Avionik Systeme, Thales, and Zodiac to form OEM Services, a company providing customer support for Airbus operators.

Other Services

Together with its affiliates, Lufthansa Technik is one of the largest providers of aircraft MRO (Maintenance, Repair and Overhaul) services worldwide. Headquartered in Hamburg, the company's activities range from the maintenance and overhaul of commercial aircraft, engines, and components to the completion of business jets. The company also performs specialized tasks such as modifications and cockpit-upgrades. Lufthansa Technik services Airbus, Boeing, General Electric, Rolls-Royce, and Pratt & Whitney equipment.

## End Users

Aircraft Manufacturers

The chief end user of aircraft components and materials in Germany is Airbus Deutschland, headquartered in Hamburg. Airbus has seven production sites in the country, all of which play a decisive role in the engineering of Airbus aircraft, including components production and final assembly. Moreover, the EADS group has around 20 manufacturing facilities in Germany where development and production in the areas of satellite systems, military fighter and transport aircraft, weapons systems, and space launchers takes place. EADS procures more than 70% of the costs of a system externally, sourcing from suppliers who, in return for sharing some of the business risks can take key roles in the EADS value chain.

Airlines

End-users of aircraft are the major German airlines, such as Lufthansa and their charter unit Condor, Air Berlin, dba (former British Airways Germany), the TUI owned Hapag-Lloyd Express and Germanwings. Germany's Deutsche Lufthansa is the third largest passenger airline in Europe and the second largest cargo airline in the world. Total revenue for the Lufthansa Group amounted to €16.5 billion in 2004. Lufthansa German Airlines carried 50 million passengers last year, generating revenue of €11.2 million. The

company operates a fleet of 320 aircraft, including 135 Airbus and 90 Boeing aircraft. The remaining part mainly consists of Canadair aircraft for domestic services.
In terms of passenger volumes, the charter carrier Air Berlin is the second largest German airline. In 2004, the airline carried 12 million passengers and expects to service 2 million more travelers in 2005. Last year the company generated revenue of just over €1 billion. Air Berlin's fleet consists of over 40 Boeing aircraft, followed by dba with 29 mostly Boeing, Germanwings with 21 Airbuses and Hapag-Lloyd Express with 15 Boeings.

Military

Compared to the United States, Germany has a much more fragmented procurement market with much less spending on defense. In 2003, the German government spent €750 million on aerospace defense procurement. As with most government purchases, preference is given to domestic products. In 2003, 98% of all procurement contracts were awarded to German companies. 1.2% of aerospace procurement spending went to companies within the EU and only. 8% of procurements were from firms outside the European Union. Much of Germany's aerospace defense procurement is part of larger European projects. While offers for tender may be published in English, all tenders must be submitted in German. In addition, schedules for tenders are particularly tight. Taking all these factors into consideration, a local partner company appears to be decisive for success.

## Market Entry

The majority of direct suppliers to EADS and Airbus are strictly first-tier sub-contractors, which, in turn, are supplied by 2nd-tier manufacturers. Exceptions to this rule are made for suppliers whose products offer technological advantages over current equipment and are able to reduce development time, production costs, or overall weight. Consequently, teaming with 1st and 2nd tier suppliers in the EADS/Airbus supply network represents the best opportunity for small and medium-sized U.S. firms to work with either manufacturer.

Although the German aerospace industry is highly concentrated at the 1st tier supplier level, lower levels of the supply chain remain fragmented. To build a competitive advantage and secure supplier contracts with systems integrators, German equipment manufacturers have to cooperate with other suppliers in the aerospace industry. For U.S. companies looking to enter the German aerospace market, partnering with a German supplier to a larger company as a sub-supplier of that firm seems to be the most practicable entry strategy. This preceding sentence is convoluted, needs to be simplified. This is especially true in the cabins and cabin systems sub sector, an important segment of the German aerospace industry that has yet to consolidate.

## Contacts

**German Aerospace Industries Association**
(Bundesverband der Deutschen Luft- und Raufahrtindustrie e.V. – BDLI)
www.bdli.de

**The European Association of Aerospace Industries**
www.aecma.org

## Upcoming Trade Fairs

**Aerospace Testing & Aircraft Interiors Expo**
Hamburg
April 4-6, 2006
www.aerospacetesting-expo.com
www.aircraftinteriors-expo.com

**Berlin Air Show** (ILA) – International Aerospace Exhibition and Conferences
May 16-21, 2006
www.ila-berlin.com

**AERO Friedrichshafen** – General Tradeshow for Business and Private Aviation
April 2007
www.aero-friedrichshafen.com

**Inter Airport Europe** – Airport Equipment, Technology, and Services
Munich
October 2007
www.interairport.com

At all of these shows the U.S. Commercial Service provides assistance to U.S. exhibitors by counseling, matchmaking programs and market briefs. There are U.S. pavilions and in the case of ILA and AERO the shows are certified by the U.S. Commercial Service.

### For More Information

Mr. Juergen Mueller, Commercial Specialist
US Commercial Service Hamburg
Consulate General of the United States
Alsterufer 27-28
D-20354 Hamburg
Tel. +49-40-411 71-313
Fax. +49-40-410 6598
E-mail: Juergen.Mueller@mail.doc.gov

See our website: http://www.buyusa.gov/germany/en/.

You can locate your nearest U.S. Export Assistance Center, as well as Commercial Service offices overseas by visiting www.buyusa.gov